遗传 2006 28 (9): 1191-1198 ISSN: 0379-4172 CN: 11-5450/R

专论与综述

从QTL到QTG的路还有多远?

曾长英[1,2], 徐芳森[1,2], 孟金陵[1], 王运华[2], 胡承孝[2]

1. 华中农业大学作物遗传改良国家重点实验室, 武汉 4300700; 2. 华中农业大学资源与环境学院微量元素研究中心, 武汉 430070

收稿日期 2005-8-24 修回日期 2005-11-28 网络版发布日期 2006-9-5 接受日期

摘要

植物大多数重要的经济性状都是数量性状, 人们对许多植物进行了数量性状基因座(QTL)的研究, 并取得了长足的发展。文章详尽地分析了数量性状表型与基因型的复杂关系, 介绍了当前QTL研究领域里的几种精细作图策略。讨论了当前挖掘控制目标性状QTL基因的研究过程中存在的困难和问题, 提出几个有待发展的研究方向, 并展望了该领域的发展前景。因目前的QTL仍然是一个相当大的染色体区段, 往往含有多个候选基因。文章就怎样从QTL粗放位点研究进一步发展到数量性状基因(quantitative trait gene, QTG)水平上的变异, 再从QTG到相应于基因内多态性的数量性状核苷酸(quantitative trait nucleotides, QTN), 提出了一些见解。来迎接后基因组时代数量遗传领域的挑战。

关键词 复杂表型 数量性状基因(QTG) 分子机理 精细定位 分离策略 候选基因

分类号 Q348

How Long the Way from QTL to QTGs?

ZENG Chang-Ying[1,2], XU Fang-Sen[1,2], MEMG Jin-Ling[1], WAMG Yun-Hua[2], HU Cheng-Xiao[2]

1. National Key Laboratory of Crop Genetic Improvement, Huazhong Agricultural University, Wuhan 430070, China; 2. Microelement Research Center, Huazhong Agricultural University, Wuhan 430070,China

Abstract

<P>Most of the important economic traits in higher plants are quantitative traits. Genetic basic researches for quantitative traits were strongly promoted. This article fully elaborated the complicated relationship between quantitative phenotype and its genotype, introduced the recently developed strategy of fine mapping. discussed the current difficulty and hardness among the process of dissect the genetic basis of target traits, then brought forward several research direction that remained to be improved , and finally gave a view of such prospect. Generally speaking,, however, a QTL is still a considerable DNA fragment frequently containing multiplex genes. We also provided some ways and means from QTL coarse locus research to the variation at quantitative trait gene (QTG) level and from QTG to quantitative trait nucleotides (QTN) corresponding to alleles resulted from the intragenetic polymorphism. This is a major challenge for quantitative genetics in the post-genome era.</P>

Key words complex phenotypes quantitative trait genes (QTG) molecular basis accurate mapping isolation strategy candidate gene

DOI:

通讯作者 徐芳森 fangsenxu@mail.hzau.edu.cn